

EPA NEW ENGLAND'S APPROVAL DOCUMENTATION FOR CT DEP'S HAYDEN CREEK TMDL ANALYSIS

Effective Date: April 19, 2002

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. §130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.

*EPA New England received a **Total Maximum Daily Load Analysis for Hayden Creek, Clinton, Connecticut** from Connecticut Department of Environmental Protection (CT DEP) on February 14, 2002, with a request to review and approve TMDLs for copper, zinc, and lead. The TMDL submission and our approval documentation includes the following:*

- *Submittal letter dated February 4, 2002, and received by EPA New England February 14, 2002,*
- *Total Maximum Daily Load Analysis for Hayden Creek, Clinton, Connecticut*
- *Response to Comments Received*
- *Copy of Publication of Public Notice of TMDL in the Hartford Courant, December 19, 2001*

- **Description of Waterbody, Pollutant of Concern, Pollutant Sources and Priority Ranking**

The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyll *a* and phosphorus loadings for excess algae.

a. Description of surface water pollutant of concern and priority ranking as appears on 303(d) list:

The TMDL analytical document identifies Hayden Creek as it appears in Connecticut's 1998 List of Waterbodies Not Meeting Water Quality Standards, including its status as having potential for exceedances of water quality-based limits for copper, lead and zinc. It is ranked as a top priority and targeted for development of a TMDL within two years.

An adequate description of Hayden Creek's physical and biological characteristics, and watershed and land uses is presented in the final TMDL document (page 2). Also, a figure is provided which locates the creek and the watershed's lone point source.

Cooper, zinc, and lead are identified in the final TMDL document as the pollutants of concern. The final TMDL submission provides an adequate description of the sources of these pollutants: the Unilever Home and Personal Care USA facility.

EPA New England concludes that the final TMDL document adequately identifies and describes the surface water, pollutants of concern, and the ranking of Hayden Creek as it appears on the 1998 303(d) list.

b. Point source(s): magnitude and location

The TMDL analytical document identifies the sole point source as the combined sanitary and industrial discharge from the Unilever Home and Personal Care USA facility, and adequately describes its magnitude and location. It states (page 2) that the Unilever facility could not operate a treatment plant capable of consistently meeting project water quality-based limits for copper, lead, and zinc in Hayden Creek. During critical (low flow) conditions, there is no other source of water in the creek where the Unilever facility effluent enters it and consequently, there is no opportunity for dilution. Therefore, the implementation plan of these TMDLs includes reissuing the permit to Unilever's facility with a compliance schedule to investigate alternatives for eliminating the discharge or relocating the discharge to an acceptable receiving water. DEP considers that the most feasible option appears to be relocating the discharge to the Hammonasset River.

EPA New England has determined that the Hayden Creek TMDL submission adequately identifies and describes the point sources of pollutants.

c. Nonpoint source(s): magnitude and location

Hayden Creek is a system dominated by a point source and the initial listing was based on desk top calculations which indicated the potential for water quality-based exceedances for the identified metals from the Unilever discharge. EPA New England understands there are no upstream background sources of these metals given that the facility is at the head of Hayden Creek. The TMDL analytical document states there are no upstream sources of copper, zinc, or lead at the TMDL model location below the discharge outfall of Hayden Creek.

Hayden Creek is located along the shore of Long Island Sound, entirely in the town of Clinton. It is bordered by a lightly developed residential area to the south and a small commercial area that includes the Unilever facility. The Creek is a tidal tributary to the Hammonasset River, near where it drains into Long Island Sound, and part of its drainage is through tidal wetlands.

EPA New England concludes that the final TMDL submission adequately shows that there are no significant sources of nonpoint sources pollution that need to be accounted for in this document.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.

a. Description of Applicable Water Quality Standards

The TMDL document (pages 4 and 5) adequately describes the applicable water quality standards, including the designated use, and the applicable numeric criteria for copper, zinc, and lead (Table 1). Hayden Creek is classified SB for its entire length, from the Unilever facility at its head to its outlet into the Hammonasset River, and designated uses for Class SB surface waters include marine fish, shellfish and wildlife habitat, shellfish harvesting for transfer to a depuration plant or relay area (transplant) to approved area for purification prior to human consumption, recreation, industrial and other legitimate uses including navigation. These TMDLs are for the entire length of the creek, defined above.

b. Applicable Numeric Targets

The applicable numeric water quality criteria for copper, lead, and zinc are identified in the final TMDL document (Table 1), including the acute and chronic levels. They are consistent with CT DEP's water quality standards (CT DEP 1997).

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 C.F.R. § 130.2(f)).

The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate

measure (40 C.F.R. § 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.

In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.

a. Loading Capacity

The TMDL document identifies the loading capacities in Table 2 (page 7), and provides a discussion of the critical conditions for Hayden Creek. Critical conditions are defined as the "worst case" scenario of environmental conditions in the creek in which the pollutant load capacity in a TMDL will not exceed the Water Quality Criteria adopted by the State of Connecticut. The critical condition for these TMDLs were defined as the low flow period from July through October. For all pollutants, the critical stream flow in Hayden Creek near Grove Street was set equal to zero because no instream dilution is available during the critical low flow period.

The loading capacities for each pollutant were calculated by multiplying the adopted water quality criteria by the critical stream flow conditions. Since the critical stream flow was determined to be zero, the TMDL for each pollutant was set to zero. Based on this approach, EPA New England considers the loading capacities sufficient to meet water quality standards.

b. Strengths and Weaknesses

A strength of the analysis is the conservative approach of calculating the load capacities based on the worse case condition of low flow when the effluent is undiluted by any other flow in the creek. Any additional flow would provide dilution and improve the conditions.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 C.F.R. § 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. § 130.2(g)). Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.

If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.

Hayden Creek is a system dominated by a point source and the initial listing was based on desk top calculations indicating the potential for water quality based exceedences for the identified metals from the Unilever discharge. EPA New England understands there are no upstream background sources of these metals given that the facility is at the head of Hayden Creek. The TMDL submission identifies no nonpoint sources to Hayden Creek, and the description of the drainage area supports this conclusion, with a lightly developed residential area and a small commercial area. Consequently, the load allocations are set to zero. If sufficient development occurs in the future that could cause nonpoint source pollution to Hayden Creek, DEP can revisit the load allocations.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

The TMDLs set the Waste Load Allocations for copper, zinc, and lead at zero. DEP has determined that the single (point) source of these pollutants shall be eliminated. The reissued permit for discharges by the Unilever facility in to Hayden Creek sets a compliance schedule which requires that within 60 days of permit reissuance, Unilever must submit a scope of study and schedule for investigating alternatives for the elimination of these discharges from Hayden Creek.

The permit suggests that potentially acceptable alternatives include recycling, hauling, evaporation, or relocating the discharge through various piping schemes to the Hammonasset River. The permit also requires that within 3 years or 1095 days of the permit's issue, there is to be no discharge of copper, zinc, or lead to Hayden Creek.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

The TMDLs set the explicit Margin of Safety to zero, and have an implicit margin of safety built in. As the critical conditions under which the TMDLs are determined feature no available flow to dilute effluents, any condition better than critical would feature at least some flow to accomplish more dilution than is possible under the critical conditions. Since the TMDLs set the waste load and load allocations to zero, both at critical low flow periods and at higher flows, the TMDLs will result in receiving water quality that is better than what is needed to attain the applicable instream criteria.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1).

The TMDL submission states that no seasonal variation is included in the TMDLs as the Water Quality Criteria for the pollutants of interest here do not vary seasonally, but remain in effect all year long. The TMDLs will be protective in all seasons.

8. Monitoring Plan for TMDLs Developed Under the Phased Approach

EPA's 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001), recommends a monitoring plan when a TMDL is developed under the phased approach.

The guidance recommends that a TMDL developed under the phased approach also should provide assurances that nonpoint source controls will achieve expected load reductions. The phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. EPA's guidance provides that a TMDL developed under the phased approach should include a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards.

Although monitoring implementation plans are not a required element for the development of a TMDL and its final approval, CT DEP included implementation in its TMDL development (page X). The TMDL submission states that monitoring of the Unilever discharge will occur under the terms of the reissued NPDES permit per a schedule established in the permit. In addition, the Department of Agriculture, Bureau of Aquaculture routinely monitors the Clinton Coastal Area, including Hayden Creek.

9. Implementation Plans

On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA's approval of TMDLs.

Although implementation plans are not a required element of the development of a TMDL and its final approval, CT DEP included implementation in its TMDL development (page 7). The TMDL submission states that the only way to achieve Water Quality Standards in Hayden Creek is by eliminating the Unilever discharge from the creek. The reissued NPDES to Unilever contains a compliance schedule to investigate alternative for eliminating the discharge through recycling, hauling, or evaporation, or by relocating it via repiping to the Hammonasset River (section (d.) on page 27 of permit # CT 0000299). The compliance schedule also requires Unilever to have eliminated outputs of copper, zinc, and lead to Hayden Creek with 3 years or within 1095 days of permit reissuance (section (h.) on page 28 of permit # CT0000299).

10. Reasonable Assurances

EPA guidance calls for reasonable assurances when TMDLs are developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for EPA to determine that the load and wasteload allocations will achieve water quality standards.

In a water impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, States/Tribes are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State/Tribe implementation plans and “may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs.”

Reasonable assurance that nonpoint reductions will occur is not necessary for the Hayden Creek TMDLs. The TMDL submission states that the removal of the Unilever discharge from Hayden Creek will eliminate all sources of copper, zinc and lead.

11. Public Participation

EPA policy is that there must be full and meaningful public participation in the TMDL development process. Each State/Tribe must, therefore, provide for public participation consistent with its own continuing planning process and public participation requirements (40 C.F.R. § 130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval must describe the State/Tribe’s public participation process, including a summary of significant comments and the State/Tribe’s responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. § 130.7(d)(2)).

Inadequate public participation could be a basis for disapproving a TMDL; however, where EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Public participation for these TMDLs was achieved in accordance with CT DEP’s statutes. Documentation of the public participation and DEP’s response to comments were included in the TMDL submittal to EPA, in the form of copies of the public notice of and request for comments on the draft TMDLs in the Hartford Courant newspaper, December 14, 2001, and the submitted document, “Response to Comments received for Proposed Total Maximum Daily Load Analysis for Hayden Creek, Clinton, Connecticut.”

EPA New England concludes that CTDEP provided reasonable opportunity for public involvement and comment.

12. Submittal Letter

A submittal letter should be included with the TMDL analytical document, and should specify whether the TMDL is being submitted for a technical review or is a final submittal. Each final TMDL submitted to EPA must be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final submittal, should contain such information as the name and location of the waterbody, the pollutant(s) of concern, and the priority ranking of the waterbody.

The submittal letter (dated February 4, 2002, and received by EPA New England on February 14, 2002) adequately identified the TMDL as a final document submitted under Section 303(d) of the Clean Water Act for EPA review and approval.